Swimming pool heat pump

Directions for installation and maintenance

MODEL :

KS8R

KS12R

KS15R

KS20R

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1- Introduction

We thank you for having chosen our Heat pump.

This installation and maintenance notice contains the necessary information to its installation (delivery control, the installation, the connections) and to its repair. It is a complementary document to the user's manual which describes its instructions for use.
We invite you to read it first.

2- Caution

This document is an integral part of the product and it must stay with the unit.

This Heat pump is exclusively for heating swimming pools.
Any other use not intended and will be considered as dangerous and unsuitable.

The assembly, the electric connection and the start up must be carried out by specialized and professional person.

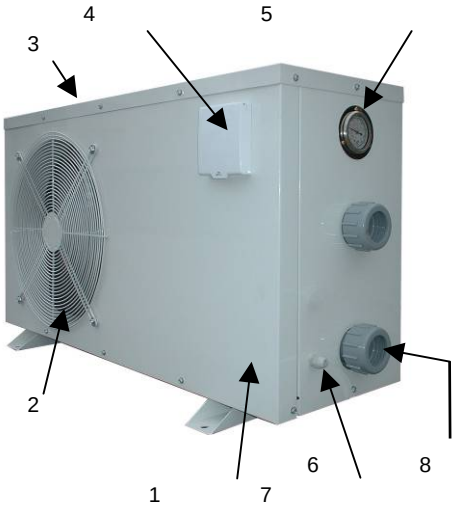
In the interests constant improvement, our products can be modified without notice, the pictures in this note or the characteristics which are described are not contractual.

3- Delivery's control

On delivery, check the condition of packing, in case of damages, please inform the carrier within 48 hours by registered letter with acknowledged receipt.

Before any manipulation, check the complete state of the machine.

Outside: (For example of model KS12R)

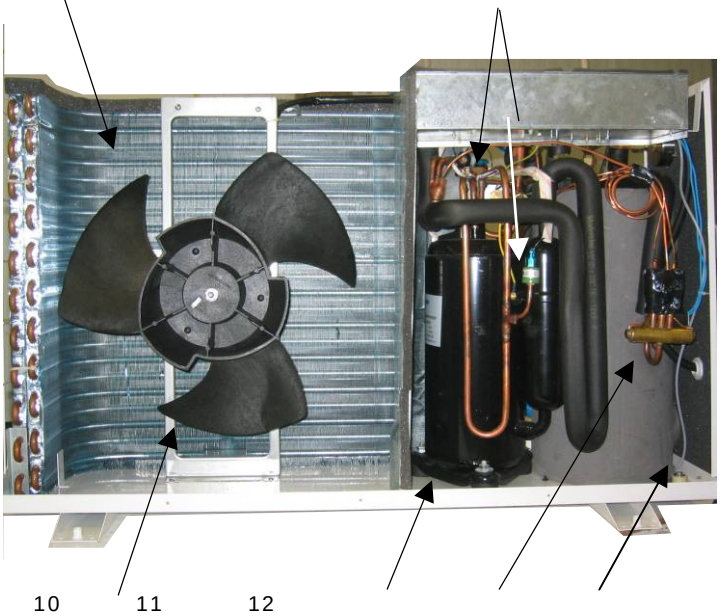


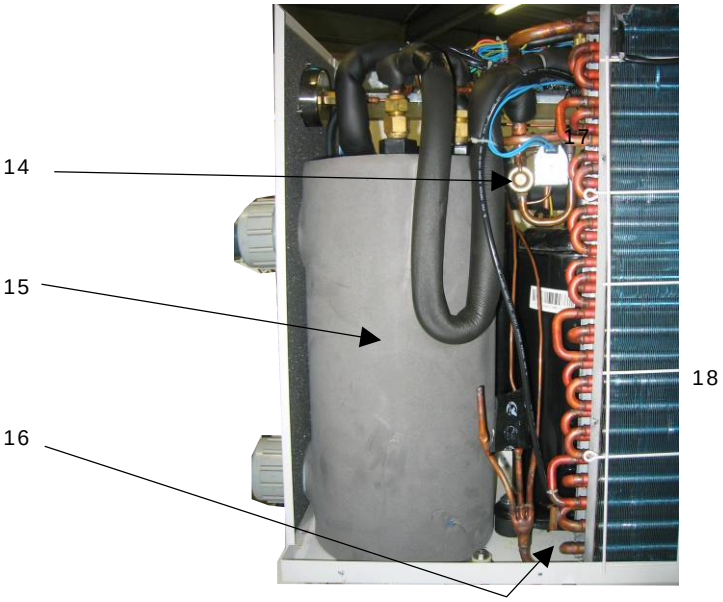
1	**Front panel in lacquered thermo sheet**
2	**Fan protection grid (blowing side)**
3	**Lacquered thermo sheet cover**
4	**Control panel with folding shutter**
5	**Pressure**
6	**Fast connectings 1”1/2 water of swimming pool (with watertightness gasket); input water at bottom**
7	**Wire pass with stuffing box**
8	**Gilled radiator (evaporator)**

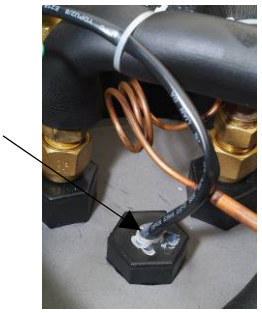
Inside: (For example of model KS12R)

(sheet cover and panels removed)

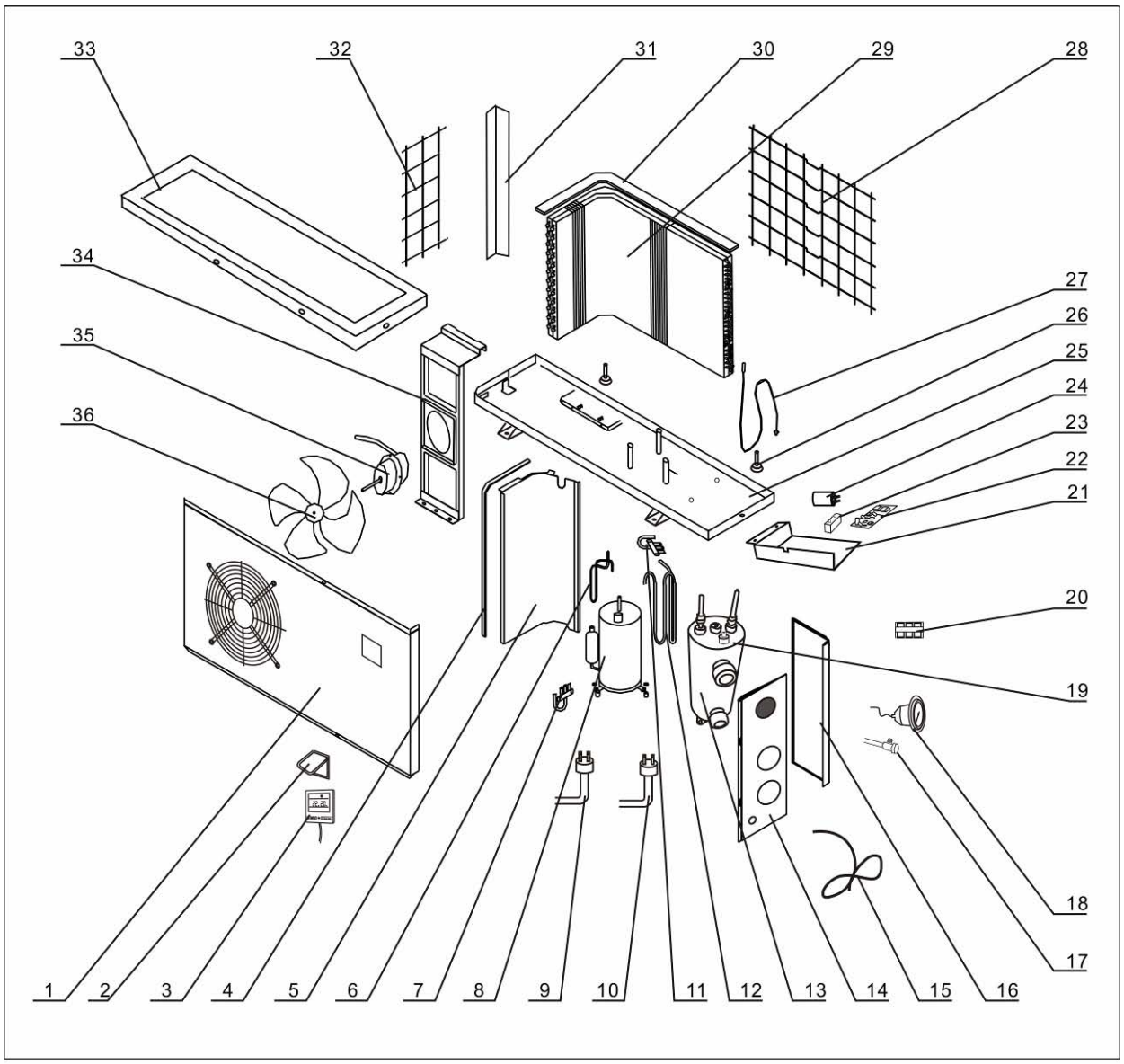
8	**Gilled radiator (evaporator)**
9	**Fan**
10	**Compressor**
11	**3 way valve (automatic selection of the expansion capillaries)**
12	**Connection of the flow detector**
13	**High and low pressure switches**
14	**4 way valve**
15	**Exchanger (condensor)**
16	**Defrosting sensor**
17	**Temperature sensor of swimming pool water**
18	**Access to the flowswitch**







Exploded View: (For example of model KS12R)



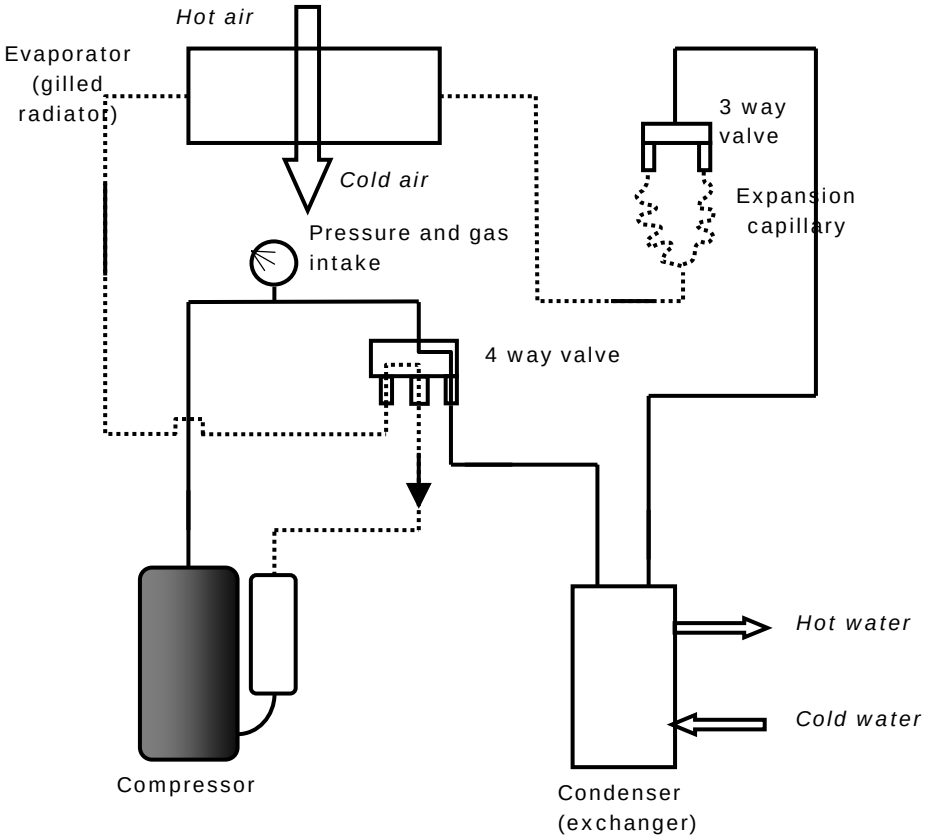
21	Electrical Box	1			
20	Terminal	1			
19	Flow detector	1			
18	Separated manometer	1			
17	Filling gas valve	1			
16	Right Rear Board	1			
15	Power Cord	1	36	Fan	1
14	Right side board	1	35	Fan Motor	1
13	Titanium and PVC Heat Exchanger	1	34	Motor Bracket	1
12	Copper pipe	1	33	Top Cover	1
11	Four Way Valve	1	32	Left Net	1
10	Low Pressure switche	1	31	Left carriage	1
9	High Pressure switche	1	30	Condenser Top Polyfoam	1
8	Compressor	1	29	Condenser	1
7	Four Way Valve	1	28	Rear Net	1
6	Copper Pipe	1	27	Defrost Sensor	1
5	Verge Board	1	26	Feet	1
4	Verge Board Polyfoam	1	25	Chassis	1
3	Control Panel	1	24	Compressor Capacitor	1
2	Control Panel Cover	1	23	Motor Capacitor	1
1	Front Panel	1	22	Circuit Board	1

General diagram of the refrigerating circuit

The heat pump is reversible allowing the swimming-pool's heating or cooling:

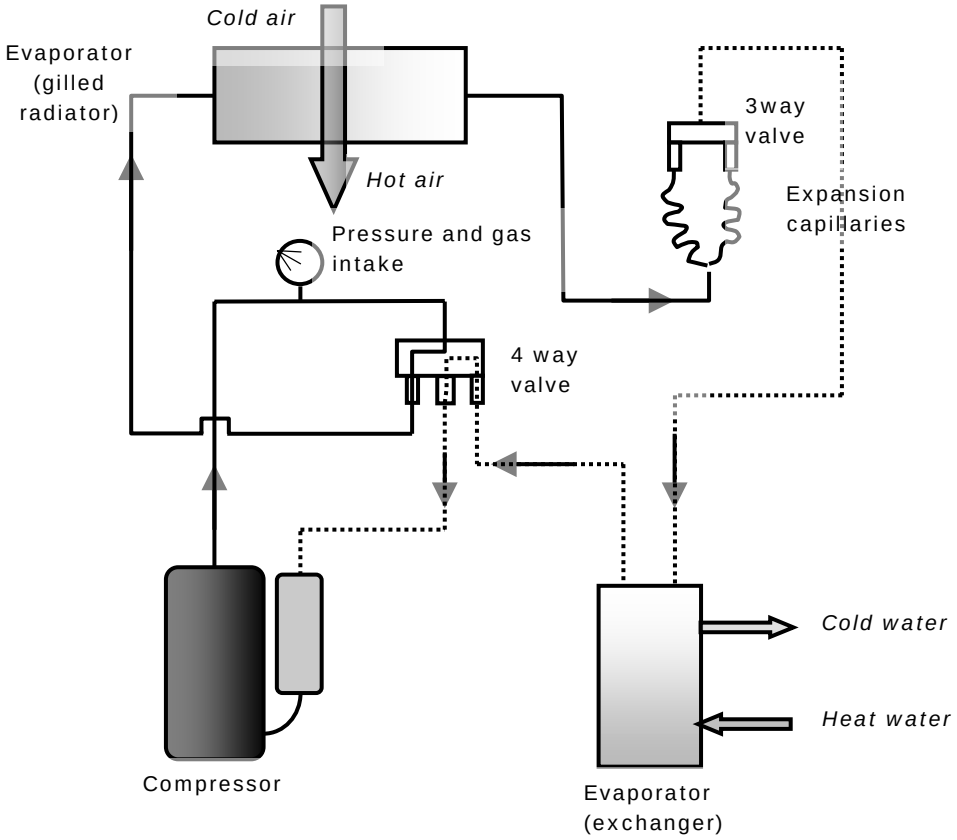
Swimming-pool water heating mode:

The cold and liquid refrigerant fluid absorbs the heat contained in the air through the evaporator (gilled radiator), in which it is vaporizing; it is then put under pressure and heated by the compressor which sends it in the condenser (exchanger) where it loses its heat (in giving it to the water of swimming pool) and comes back in liquid state; it loses its pressure and cools in the expansion capillaries before turning back to the evaporator for a new cycle.



Swimming-pool water cooling mode:

The 4 way valve reverses the circulation of the refrigerant fluid; the fluid vaporizes in the exchanger (evaporator) in getting the heat of the water, goes through in the compressor which reheats it and through in the gilled radiator (which becomes condenser) where it comes back to liquid state.



Safety and control systems

The heat pump is fitted with:

De 3 safety features :

- A temperature sensor in the evaporator, starting the defrosting operation.
- An ambient temperature sensor ensuring the cut out of the heat pump when the temperature of the external air goes below 7°C (factory settings). The normal cycle restarts when the outside temperature goes up to 12°C (factory settings); See the USER MANUAL for changing the factory settings.
- A temperature sensor placed on the exchanger, ensuring the cut out of the heat pump when the temperature of the water reaches the required temperature. The normal cycle restarts when the temperature in the exchanger goes down to a temperature lower of 2°C than this required.

With 4 safety systems:

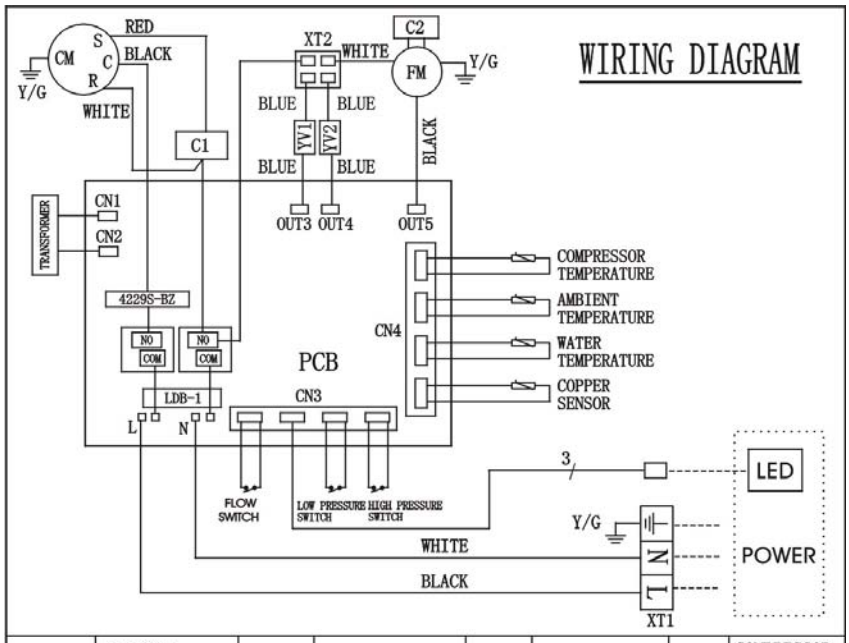
- A water flow detector placed at the entry of the exchanger
- A high pressure gas circuit breaker, a low pressure gas circuit breaker
- An outlet compressor temperature sensor
- Integrated to the card, a magnetic ammeter/circuit breaker on the compressor.

If a defect occurs on one of these systems (defective system, off-line or abnormal measured value) a error message appears on the display screen; see the paragraph “Error codes and what to do” of this note.

Caution: the removal or bypass of these safety systems negates the guarantee.

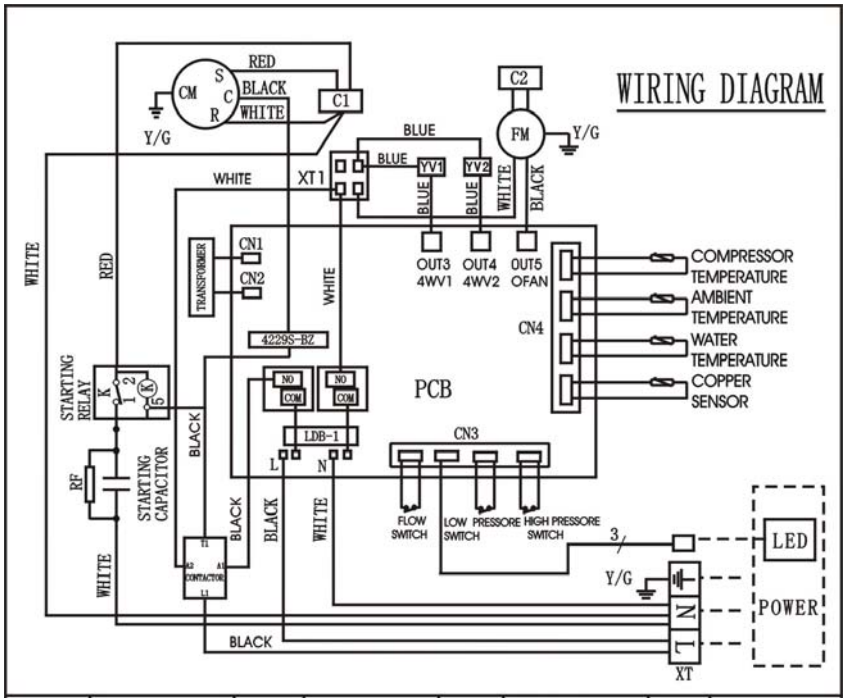
Electric diagram

KS8R



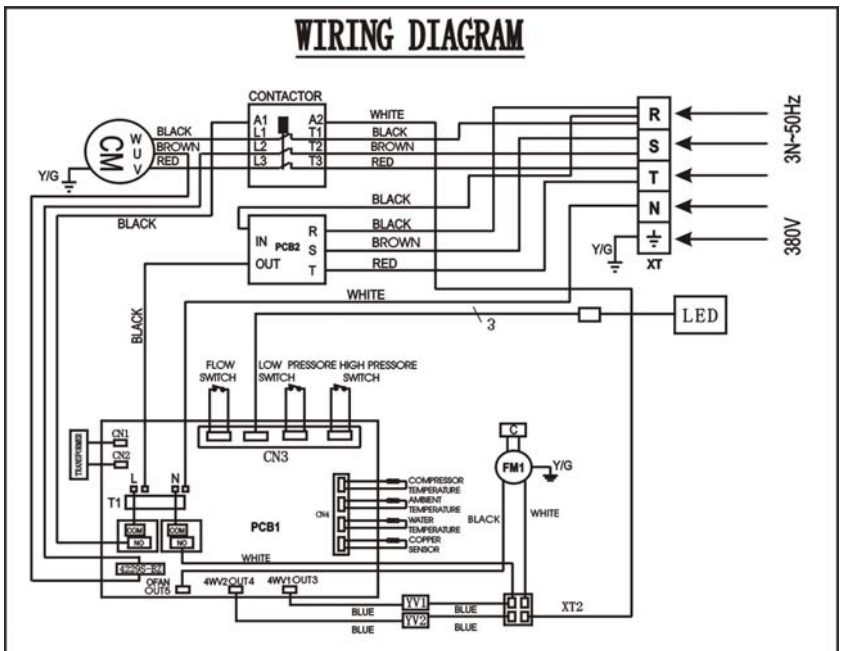
4229S-BZ	CURRENT INDUCTOR	CM	COMPRESSOR	FM	FAN MOTOR	C1	COMPRESSOR CAPACITOR 1
YV1	FOUR WAY VALVE 1	LDB-1	CREEPAGE EXAMINE	XT1	POWER TERMINAL	C2	FAN MOTOR CAPACITOR 2
YV2	FOUR WAY VALVE 2	PCB	CONTROL BOARD	XT2	PUBLIC TERMINAL		

KS12R (Single-phase)



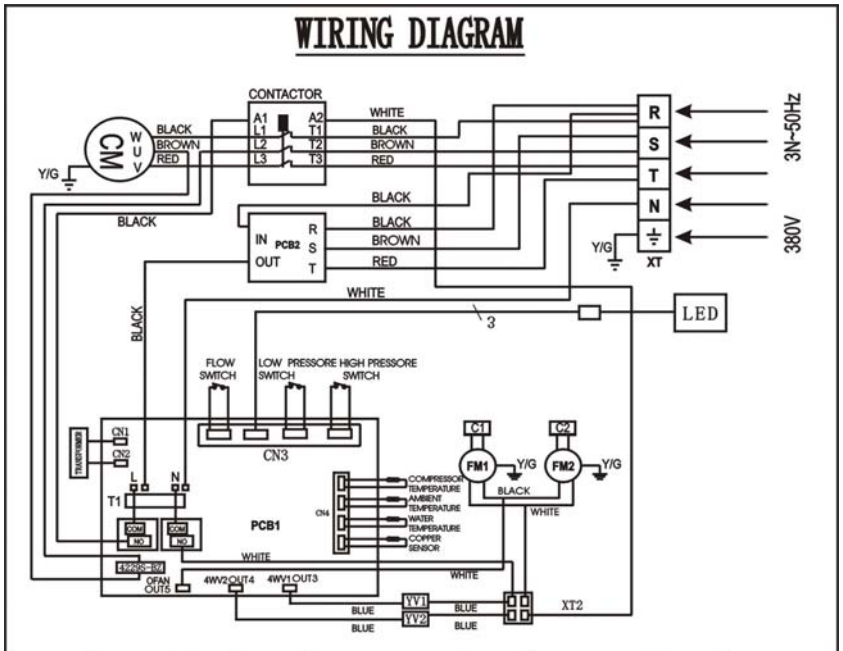
PCB	CONTROL BOARD	CM	COMPRESSOR	C1	COMPRESSOR CAPACITOR	FM	FAN MOTOR
4229S-BZ	CURRENT INDUCTOR	LDB-1	CREEPAGE EXAMINE	C2	FAN MOTOR CAPACITOR	XT	POWER TERMINAL
XT1	PUBLIC TERMINAL	YV	FOUR WAY VALVE				

KS150R



PCB	CONTROL BOARD	FM	FAN MOTOR	C	FAN MOTOR CAPACITOR	YV1	FOUR WAY VALVE 1
CM	COMPRESSOR	CN1	CONTROL DISPLAY BOARD	CMP	COMPRESSOR TEMPERATURE	YV2	FOUR WAY VALVE 2
4229S-BZ	CURRENT INDUCTOR	T1	CREEPAGE EXAMINE	OUTP	COPPER SENSOR	XT1	POWER TERMINAL
WATER1	WATER TEMPERATURE	WATER2	AMBIENT TEMPERATURE	XT2	PUBLIC TERMINAL		

KS200R



PCB	CONTROL BOARD	FM	FAN MOTOR	C1	FAN MOTOR CAPACITOR 1	YV1	FOUR WAY VALVE 1
CM	COMPRESSOR	CN1	CONTROL DISPLAY BOARD	C2	FAN MOTOR CAPACITOR 2	YV2	FOUR WAY VALVE 2
4229S-BZ	CURRENT INDUCTOR	T1	CREEPAGE EXAMINE	CMP	COMPRESSOR TEMPERATURE	XT1	POWER TERMINAL
WATER1	WATER TEMPERATURE	WATER2	AMBIENT TEMPERATURE	OUTP	COPPER SENSOR	XT2	PUBLIC TERMINAL

5- Installation

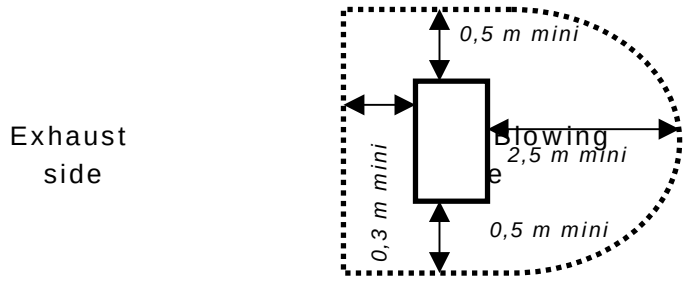
Rules of installation:

Electric and hydraulic connections must be carried out according to standards in effect (NF C 15 100, CE I 364).

The machine must be installed outside.

The machine must be fitted on its anti vibratory studs, leval and on a concrete base this base must have a sufficient height to prevent any entry of water into the bottom of the machine. Height must be adjusted to fit the connector collecting the condensates.

All obstacles such as wall and vegetation must be separated from the machine as indicated on the diagram below.



Do not to install the Heat pump in a confined place (the fan would recycle its air and the Heat pump will have reduced performance).

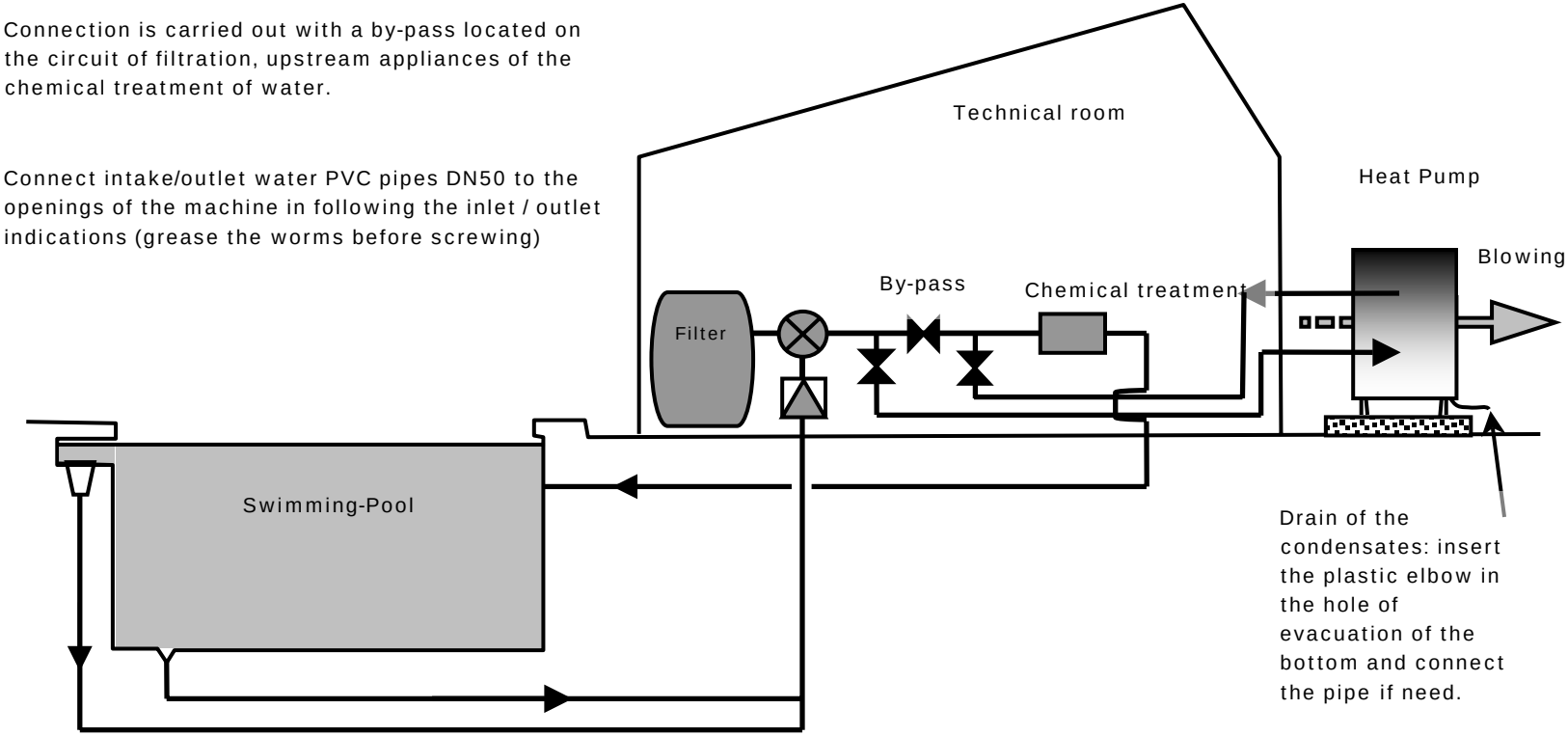
Other precautions of installation:

- Avoid directing blowing against dominant winds.
- If the machine is intended to be used in winter, put it in a place protected from the falls of snow.
- The machine must be able to be supervised in order that children do not play nearby

Hydraulic connections:

Connection is carried out with a by-pass located on the circuit of filtration, upstream appliances of the chemical treatment of water.

Connect intake/outlet water PVC pipes DN50 to the openings of the machine in following the inlet / outlet indications (grease the worms before screwing)


Technical room
Heat Pump
Blowing
By-pass
Chemical treatment
Filter
Swimming-Pool
Drain of the condensates: insert the plastic elbow in the hole of evacuation of the bottom and connect the pipe if need.

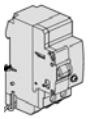
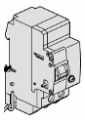
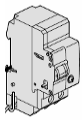
Electric connections:

CAUTION: before connecting the machine, make sure that the power supply is disconnected.

The electric installation must be carried out by an experienced electrician and the supply must have differential protection; the installation must be carried out according to current regulations in the country where the material is installed.

Characteristics of the electric supply:
- 230 V +/- 10%, single-phase current, 50 Hz, or 380 V +/- 10%, three phase current, 50 Hz. (According to the actual model)
- Mode of neutral TT and TN.S; the circuit of heat pump must be connected to an earth circuit.

Procedure of use

Action	External appliance or button of heat pump	Display	Heat pump answer
Put the heat pump under tension	Engage the circuit breaker of the heat pump 		Indicate the current hour
Put in circulation the swimming pool water into the pipes	Engage the circuit breaker of pump of filtration 		Indicate the current hour
Start	Press the button ON/OFF		Start between 1 second and 4 minutes in the last active mode (heating or cooling)
Go from heating mode to cooling mode or inversely from cooling to heating	Press the button MODE		Stop for 4 minutes, reverse of cycle and restart in a new mode
Set the wished temperature into the swimming pool	Up and Down adjustable from 10°C to 35°C		The heat pump heats or cools until the required temperature
Stop	Press the button ON/OFF		Immediate stop and wait
Switch off	Use the circuit breaker of pump of filtration 		Complete stop

Nota : for the hour setting, see the User Manual.

6- Water Flow and refrigerating circuit pressure

After putting into service, adjust the pressure of the refrigerant circuit for optimal operating of the heat pump, following:

Stage 1:
Access to the seal of the filling gas valve in removing the rubber cover ; before starting the Heat Pump, connect the manometer, the needle must show before starting an ambient temperature around 20°C, a pressure from 14 to 16kg/cm².

Stage 2:
Close completely the by pass valve and open the inlet and outlet valves of the Heat Pump; in these conditions the totality of the water flow goes by the Heat Pump.
Put the Heat Pump in heating mode, wait for the indicated pressure to stabilized; the correct setting of the pressure is from 28 to 30 kg/cm²;
In most of cases you do not have to open the by pass valve.
If the stabilized pressure is under 28kg/cm², the progressive opening of the by pass valve will allow a rise in this pressure.

The adjustment of the by pass valve done, you have in principle no reason to modify it during the season. See the paragraph “Environment problem” too.

7- Defrosting

The defrosting is necessary only in heating mode.
Sequences of the defrosting:

1- Start
The defrosting is engaged if the following conditions occur:
- the defrosting sensor temperature goes down to -9°C
- the compressor runs without stopping for 5 minutes
- the compressor had run totally 45 minutes

2- The compressor and the fan stop
3- After 20 seconds, the 4 way valve shifts
4- One minute after its stop, the compressor starts alone and the accumulated frost on the gills becomes melting
5- The defrosting stops if one of the following conditions occurs:
- the defrosting operates 20 seconds and the detected temperature
- by the defrost sensor goes up to 7°C.
- the compressor has run for 8 minutes
6- The compressor stops
7- After 1 minute the 4 way valve shifts
8- Two minutes after its stop the compressor and the fan restart in heating mode.

8 – Environment problem

Under certain external conditions the heat exchanges between the refrigerant and the water on one hand and between the fluid and the air on the other hand are insufficient; the consequence is that the refrigerating circuit builds up in pressure and the compressor consumes more electricity.

The temperature sensors on the compressor outlet and the magnetic circuit breaker on the compressor power supply protect the compressor from these extreme conditions; the error messages *E 05* or *E 06* occur.

The condition causing this situation is as follows:
In heating mode:
- insufficient water flow: close the by-pass valve for increasing the refrigerant exchange → water

In cooling mode:
- too high water flow: open the by pass valve to decrease the water flow and so the exchange water → refrigerant
- insufficient air flow: be sure that the gills of the radiator are not blocked.

Nota: these error codes are likely to occur if temperature of swimming pool water is high and the ambient air is hot.

9 – Error codes and what to do:

This table explains the error codes caused by a defective regulating component or by a security operation.

Screen and state of the heat water pump	Component	Possible	Intervention	Second reason if the intervention is without effect
E 1 **The heat pump continues running**	**Water temp sensor**	**Sensor disconnected, non supplied or defective**	**Check the connections, the wires, change it or replace the electronic card**	
E 2 **The compressor stops and after the fan stops too**	**Ambient air temperature sensor**	**Sensor disconnected, non supplied or defective**	**Check the connections, the wires, change it or replace the electronic card**	
E 3 **The heat pump continues running**	**Oultlet compressor temperature sensor**	**Sensor disconnected, non supplied or defective**	**Check the connections, the wires, change it or replace the electronic card**	
E 4 **Compressor and fan stop**	**Defrosting system**	**The defrosting is incomplete and the automatism decides to stop the heat pump**	**Increase lightly the water flow going into the heat pump; the effect is to increase the temperature of the refrigerant in the evaporator.**	
E 5	**Magnetic ammeter**	**The compressor stops 3 times in 24h because of intensity excess in the compressor**	**Environment problem See §8**	
E 6 **Compressor and fan stop**	**Oultlet compressor temperature sensor**	**Oultlet compressor temperature detected up to 105°C more than 3 times in 24h**	**Environment problem See §8**	
E 7 **Compressor and fan stop**	**Magnetic circuit breaker**	**Electric current leak from the compressor, from the fan or from an electrovalve; electric safety system of the heat pump**	**Switch off the current and call an electrician for repairing or replacing the defective component**	
	Flow switch	**Flow switch disconnected, non supplied or defective**	**Check the connections, the wires, change it or replace the electronic card**	
The compressor hums without starting and the electric supply breaks	**Starting condenser of the compressor**	**The condenser is defective**	**Replace the condenser**	**Compressor piston clamped, call a refrigerating engineer**
E 9	**High pressure pressostat**	**Pressostat is disconnected, or defective**	**Call a refrigerating engineer who will do the necessary controls of the circuit pressure**	
E A	**Low pressure pressostat**	**Pressostat is disconnected, or defective**	**Call a refrigerating engineer who will do the necessary controls of the circuit pressure**	